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January 19, 2005
Date of Signature

Re:	Application of:	Slater et al.
	Serial No.:	09/748,720
	Filed:	December 26, 2000
	For:	Excessive Surge Protection Method and Apparatus
	Group Art Unit:	2836
	Examiner:	D. Nguyen
	Our Docket No.:	1505-0094

TRANSMITTAL OF SUPPLEMENTAL BRIEF ON APPEAL

Please find for filing in connection with the above patent application the following documents:

1. Request for Reinstatement of Appeal;

2. Original of the Second Supplemental Appeal Brief;

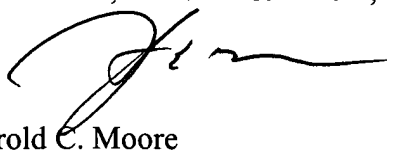
3. Three (3) copies of the Second Supplemental Appeal Brief; and

4. One (1) return post card.

Please charge any fee deficiency, or credit any overpayment, to Deposit Account No. 13-0014; but not to include any payment of issue fees.

Respectfully Submitted,

MAGINOT, MOORE & BECK, LLP



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Enclosures

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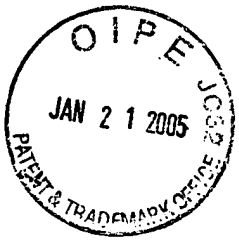

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REQUEST FOR REINSTATEMENT OF APPEAL

PURSUANT TO 37 C.F.R. § 1.193(b)(2)

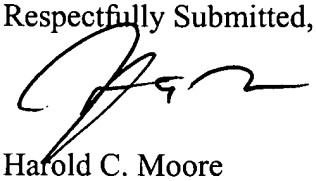
Sir:

In connection with the Office Action mailed October 19, 2004 in the above-entitled patent application, the Applicants respectfully request reinstatement of an appeal. The Applicants filed a Notice of Appeal on October 22, 2003 and an Appeal Brief on December 22, 2003. On March 26, 2004 the Examiner issued a Non-Final Office Action. The Applicants filed a Request for Reinstatement and a Supplemental Appeal Brief on July 26, 2004. On October 19, 2004 the Examiner issued another Non-Final Office

Action. Applicants file herewith a Second Supplemental Brief on Appeal, along with three (3) copies of the Second Supplemental Appeal Brief.

The filing fee of an Appeal Brief ($330.00) as required by 37 C.F.R. § 1.17(e) was previously submitted.

Respectfully Submitted,



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	Group Art Unit:	2836
	Examiner:	D. Nguyen
	Our Docket No.:	1505-0094

SECOND SUPPLEMENTAL APPEAL BRIEF

Sir:

This is a Second Supplemental Appeal Brief filed under 37 CFR § 1.193(b)(2), pursuant to an appeal under 37 CFR § 1.191 to the Board of Patent Appeals and Interferences of the United States Patent and Trademark Office from the final rejection of claims 1-5, 25-29, 34, 35, 37 and 38 of the above-identified patent application. These claims were indicated

as finally rejected in an Office Action dated July 23, 2003. In response to an appeal brief filed on December 22, 2003, prosecution was reopened pursuant to an office action dated March 26, 2004. A Supplemental Appeal Brief was filed on July 26, 2004. In response to the Supplemental Appeal Brief, prosecution was again reopened pursuant to an office action dated October 19, 2004. Three copies of the brief are filed herewith.

It is believed that no fee is due. However, please charge any additional fees which may be due to Deposit Account No. 13-0014, but do not include any payment of issue fees.

(1) REAL PARTY IN INTEREST

Landis+Gyr Inc. is the owner of this patent application, and therefore the real party in interest.

(2) RELATED APPEALS AND INTERFERENCES

There are no appeals or interferences related to this patent application.

(3) STATUS OF CLAIMS

Claims 1-5 and 24-38 are pending in the application. Claims 6-23 have been withdrawn from consideration.

Claims 1-5 and 25-29, 34, 35, 37 and 38 stand rejected and form the subject matter of this appeal. Claims 32 and 33 have been allowed, and claims 24, 30, 31 and 36 have been objected to as being dependent upon a rejected base claim. Claims 1-5 and 24-38 are shown in the Appendix attached to this Appeal Brief.

(4) STATUS OF AMENDMENTS

Applicants filed a Response to Office Action dated May 6, 2003 ("First Response") responsive to an Office Action dated November 6, 2002. A final Office Action dated July 23, 2003 was designated by the Examiner to be responsive to the First Response. Applicants filed an Appeal Brief on December 22, 2003. In response to the Appeal Brief, the Examiner re-opened prosecution and issued an Office Action dated March 26, 2004. Applicants filed a Supplemental Appeal Brief on July 26, 2004. In response to the Supplemental Appeal Brief, the Examiner again re-opened prosecution and issued an Office Action dated October 19, 2004.

(5) SUMMARY OF THE INVENTION

The present invention is directed to a surge protection device that includes a circuit composed of components connected in series. (See, e.g. application at Fig. 3). While the invention is set forth in the claims, exemplary embodiments are discussed in the application in connection with Fig. 3. With reference to Fig. 3 of the application the surge protection device 11 includes a voltage input 7 connected to the voltage source 2, which is a utility power line. An inductor 8 is series connected between the voltage input 7 and a resistor 14. The other end of resistor 14 is connected to a first end of a PPTC 3. The other end of the PPTC 3 is connected to a resistor 4 that is part of a surge protection circuit mounted on printed wiring board 1. The other end of resistor 4 is connected to an MOV 5 that is disposed in parallel with the load 6. The voltage source 2, MOV 5, and the load 6 are each connected to a common ground at their respective other ends. (Application at p.7, Fig. 3).

The voltage input 7 may suitably be an input of any circuit (load 6) that is coupled to an electrical utility power line. Electrical utility power lines have AC voltage levels that may be 120 volts, 240 volts, 480 volts, as well as other levels. In the context of a 480 volt AC utility power line, potential overvoltages have been reported at up to 20000 volts. The exemplary embodiment described herein is configured to accommodate overvoltages of this magnitude, as well as lesser magnitude overvoltages. (*Id.* at pp.7-8)

The PPTC 3 is a polymeric positive temperature coefficient device used as a resettable fuse. Such devices have the characteristic that they stop conducting as their temperature exceeds a threshold. The device characteristics are such that below the PPTC's pass current level, the PPTC operates as a resistor of nominal resistance. However, in excess of its specified threshold current, its temperature increases to a point in which its resistance increases. If the current remains above the PPTC's threshold, the PPTC will trip and behave as an open circuit. The trip time decreases as the current increases. Suitable PPTC devices include the available from Raychem Corp. of Menlo Park, California. In the exemplary embodiment described herein, the PPTC 3 has a 145 milliampere maximum pass current, and by way of example, has a trip-time current curve such that it will trip in 10 seconds if the current is 400 milliampere, and in 0.45 seconds if the current is 1 ampere. (*Id.* at p.8)

The resistor 14 may suitably be a wire wound, axial lead type resistor. The resistor 14 is selected to assure that the minimum resistance does not drop below a threshold necessary to limit surge current, and subsequent power follow through, to a maximum current amount. Typical values for the resistor 14 are 50 ohms, 20 ohms, or 10 ohms. In a preferred embodiment, the resistor 14 is a 50 ohm, 4 watt resistor. The use of

an axial lead resistor reduces the possibility of a sustained arc in the event of a failure of the resistor. (*Id.*)

The inductor 8 is used to prevent short duration current spikes from appearing at the PPTC 3 as well as the printed wiring board 1. The prevention of short duration current spikes reduces the possibility that a transient overvoltage will damage portions of the load 6 or the PPTC 3. In the exemplary embodiment described herein, the inductor 8 is a 100 microhenry inductor having a dc resistance of 3.2 ohms. The inductor 8 should be chosen such that it suppresses transient currents for a sufficient time to let the PPTC 3 begin to restrict the current for at least some overvoltage levels within the range of expected overvoltages. The purpose of preventing high impulse currents from reaching the PPTC 3 is to prolong the life of the PPTC 3. (*Id.* at pp.8-9)

It is recognized that size constraints can limit the inductor that is used. Those of ordinary skill in the art may readily select an appropriate inductor to suit their current suppression and size constraints. (*Id.* at p.9)

The surge protection device 11 preferably further includes a protective barrier 10 that separates or isolates the inductor 8, resistor 14, and PPTC 3 from the load 6. The protective barrier 10 may take infinitely various forms, but basically includes a wall, sleeve or compartment constructed of inflammable material, such as, for example, certain plastics. (*Id.*)

The load 6 will typically include a housing, not shown, that may incorporate such a barrier, or in which such a barrier may be defined. For example, in U.S. Patent No. 5,933,004, which is incorporated herein by reference, a utility meter is shown in that includes a load circuit board (element 34 of that patent) and an electrically safe interface

(element 26). In such an embodiment, by placing the inductor 8, resistor 14 and the PPTC 3 on the opposite side of the electrically safe interface from the load circuit board, the electrically safe interface serves as the protective barrier 10 according to the present invention. (*Id.*)

Alternatively, the protective barrier 10 may comprise a protective sleeve constructed out of a shrink tube or shrink packaging element that largely surrounds the inductor 8, resistor 14, and the PPTC 3. The protective sleeve can be formed from any suitable electrical insulator such as PTFE or plastic. (*Id.* at p.10)

In general, the protective barrier 10 must resist combustion and must inhibit flying debris that may occur upon the failure of any or all of the inductor 8, resistor 14, and PPTC 3 from reaching the load 6 to prevent such debris from causing secondary arcing between components and/or connectors in the load 6 (i.e. on the circuit board 1). Those of ordinary skill in the art may readily define their own protective barrier 10 to suit the construction and housing of their particular load 6. For the purposes of the discussion herein, the load 6 is considered to include any elements on the printed circuit board 1 that pose a potential arcing hazard. (*Id*)

The protective barrier 10 provides a safeguard in the event of a catastrophic failure of any of the inductor 8, the resistor 14 and the PPTC 3. As discussed above, without the protective barrier 10, a catastrophic failure could result in emitted debris, which can initiate secondary arcing in the circuitry or contacts of the load 6. To facilitate containment of any such debris, the protective barrier 10 physically isolates the inductor 8, the resistor 14, and the PPTC from the load 6 (and/or other circuitry on the printed circuit board 1). (*Id.*)

In normal operation, the voltage source 2 provides normal line voltages to the load 6 through the inductor 8, the resistor 14, the PPTC 3, and the resistor 4. In the event of an overvoltage that results, or attempts to result in an arc, the inductor 8 immediately acts to suppress high transient currents that could support an arc. In the event that overvoltage continues, the resistor 14 operates to limit the current available to support an arc. In addition, the temperature of the PPTC 3 increases as a result of the excessive current flow. If the surge voltage is too high, then the MOV 5 starts conducting to limit the applied voltage to the load 6. (*Id.* at p.10-11)

In many cases, the operation of the PPTC 3 will sufficiently prevent any arcing until the overvoltage situation is over. Accordingly, the PPTC 3 operates as a *resettable* fuse. As a result, the surge protection device 11 does not necessary require replacement after each overvoltage event. (*Id.* at p.11)

In other cases, the overvoltage may nevertheless create an arc. If an arc occurs, then the resistor 14, inductor 8, or PPTC 3 may rupture. Such rupture, however, stops excessive currents from being sustained by creating an open circuit. Any or all of the components may rupture due to the excessive current and thus create an open circuit. The protective barrier 10 inhibits and preferably prevents the debris from the destroyed component from contacting the circuitry of the load 6 or other elements. (*Id.*)

A variation of the device 11 uses only the inductor 8 and PPTC 3 in series, removing the resistor 14. This embodiment is advantageous for applications where adding the resistor 14 would affect the operation of the load 6. For example, in an exemplary embodiment of the surge protection device employed within an electricity meter, addition of the resistor 14 could in some cases undesirably affect the meter's

registration accuracy. Those of ordinary skill in the art may readily determine whether the added current limiting capabilities provided by addition of the resistor 14 outweigh any negative effect on the operation of the circuit of the load 6. (*Id*)

Another variation of the device 11 uses only an inductor 8 or PPTC device 3 separated by the protective barrier 10 from the load 6. Where a single breakdown device is used in the device 11, excessive currents are ultimately limited by a rupturing of the breakdown device. Otherwise, the breakdown device (inductor 8 or PPTC 3) provides the suppression capabilities discussed above in cases in which surge does not cause a rupture. For example, the PPTC 3 increases in resistance until it behaves as an open circuit. If the PPTC 3 thereafter ruptures, it opens the circuit and thus inhibits a sustained arc. The inductor 8 alone also operates in an analogous manner. (*Id.* at pp.12)

The PPTC 3 alone may be useful in environments in which fast transient surges are relatively rare, and longer time constant, sustained surges are more prevalent. The inductor 8 alone may be useful in environments in which fast transient surges are common. (*Id.*)

In yet another embodiment, the protections provided by the combinations of the PPTC 3 and the inductor 8 (with or without the resistor 14) may be sufficient *without the protective barrier 10* if the elements are chosen to withstand the highest possible voltage surges. In any event, at least one aspect of the present invention relates to the protections provided by the combination of the inductor 8 and the PPTC 3 regardless of whether a protective barrier is present. (*Id.*)

In the selection of the components 3, 8 and 14, the desired series impedance of the surge protection device 11, and the individual resistances, transient responses and

impedances of the components 3, 8, and 14 must be considered. In addition, disconnect mechanisms (not shown) can be connected in series with the components 3, 8 and 14, the disconnect mechanisms operating as a back-up for creating an open circuit between the voltage input 7 and the load 6 in the event of a prolonged overvoltage surge. In conjunction with the disconnect mechanisms, visual indicators (not shown) may also be employed, so that a disconnected line can be quickly determined. (*Id.* at pp.12-13)

The present invention thus provides surge protection above and beyond that available from a simple MOV shunt. Although the configuration shown in FIG. 3 allows the full voltage to reach the printed circuit board 1, the circuit of the surge protection device 11 prevents high currents from damaging the circuit board 1 in part by using the series components as fusable devices. The PPTC 3 acts as a 'poly-fuse,' where the response time for opening the circuit is less than that required to induce rupture of the inductor 8 or the resistor 14. (*Id.*)

The actual performance can be customized according to the individual components used. For example, an inductor may be selected that accommodates voltages having predetermined transient characteristics, a resistor can be selected that limits steady state currents for a particular period of time, and a PPTC can be selected according to its melting temperature. In this manner, the surge protection device can be configured to optimize protection for a particular likelihood or risk of a known or suspected condition. For example, the environment for a particular application may have a high or low humidity, have a differing power factor, be proximate to high inductance machinery, have a greater susceptibility to a certain transient condition, or have differing grades of

electrical utility wiring. By controlling the location of a possible arcing, the magnitude and resultant damage from an excessive overvoltage condition can be controlled. (*Id.*)

Fig. 4 shows a schematic block diagram of an exemplary electricity meter 110 that incorporates three surge protection devices 11a, 11b and 11c according to the present invention. The electricity meter 110 is shown in context installed in a three phase power system. The exemplary embodiment of the surge protection devices 11a, 11b and 11c described herein protects the meter circuitry, which is typically housed on one or more printed circuit boards, from unpredictable failure modes due to excessive overvoltages and associated power follow through generated on the connected utility lines. (*Id.* at pp.13-14)

(6) ISSUES

Whether claim 1 is unpatentable under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 4,181,872 to Chermin (hereinafter "Chermin") in view of U.S. Patent No. 5,115,368 to Smith (hereinafter "Smith").

Whether claim 3 is unpatentable under 35 U.S.C. § 103(a) as being obvious over Chermin in view of Smith in further view of U.S. Patent No. 6,356,424 to Myong et al. (hereinafter "Myong").

Whether claims 4, 25, 26, 28, 29, 34 and 37 are unpatentable under 35 U.S.C. § 103(a) as being obvious over Chermin in view of Myong.

Whether claim 2, 5 and 35 are unpatentable under 35 U.S.C. § 103(a) as being obvious over Chermin in view of Myong in further view of U.S. Patent No. 5,909,168 to Miyasaka et al. (hereinafter "Miyasaka").

(7) GROUPING OF CLAIMS

The claims do not all stand or fall together.

Claim 1 forms a first separately patentable group which is argued independently of the other claims for purposes of this appeal.

Claim 3 forms a second separately patentable group which is argued independently of the other claims for purposes of this appeal.

Claim 2 forms a third separately patentable group which is argued independently of the other claims for purposes of this appeal.

Claims 5 and 35 form a fourth separately patentable group which is argued independently of the other claims for purposes of this appeal.

Claims 4, 25, 27-29, 34, 37 and 38 form a fifth separately patentable group which is argued independently of the other claims for purposes of this appeal.

(8) ARGUMENT

Discussion re: Patentability of Claim 1

1. Claim 1

Claim 1 includes the following limitations:

> a protective barrier interposed between the inductor and the load, the protective barrier configured to physically isolate the inductor from the load.

Thus, the claimed invention includes a protective barrier that is configured to physically isolate the inductor from the load.

2. The Examiner's Rejection

The Examiner rejected claim 1 as allegedly being obvious over Chermin in view of Smith. Chermin is directed to a starter for igniting a low-pressure sodium lamp. The starter is provided with an oscillator circuit consisiting of an electric coil, a first capacitor and a controlled semiconductor switching element. (See Chermin, Abstract). A positive temperature coefficient device is provided to increase the resistance of the circuit in the event that the lamp refuses to ignite.

The Examiner contends that claimed inductor was met by the coil 8 of Fig. 1 of Chermin. As admitted by the Examiner, Chermin does not disclose the claimed protective barrier between the coil 8 and the load (presumably the lamp 4). The Examiner instead relies on Smith to teach the claimed barrier. In particular, the Examiner alleges that a housing 10' of Smith constitutes the claimed protective barrier. In justifying the combination of Chermin and Smith, the Examiner provided the following reasoning:

> It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the protection circuit of Chermin to incorporate the housing as taught by Smith in order to provide physical isolation to prevent circuit components from catastrophic failure.

(October 19, 2004 office action at p.3).

As will be discussed below in detail, the Examiner's rejection is in error because there is no motivation or suggestion to make the combination of Chermin and Smith as proposed by the Examiner. Moreover, Chermin and Smith are non-analogous art, and therefore the combination of Chermin and Smith is not proper.

1. No Motivation Exists to Combine Smith and Chermin as Proposed

There is no legally sufficient motivation or suggestion to combine Chermin and Smith as proposed by the Examiner. As discussed above, the Examiner contends that it would have been obvious to combine the "housing" of Smith with the circuit of Chermin to prevent catastrophic damage to the circuit.

Applicants disagree. The housing of Smith is required by UL, CSA and other standards bodies and for the purposes of isolating live AC power conductors from human and other unwanted contact. In particular, Smith is directed to an AC power strip. A power strip as is commonly known in the art is a device that contains several AC outlets. All power strips have housings. Smith does not teach or suggest the usefulness of a housing to physically isolate an *inductor* from a load. Instead, at best, Smith teaches protecting the outside world from live AC power conductors.

Thus, as an initial matter, Smith fails to provide any motivation or suggestion to provide a housing for *physically isolating an inductor from a load* to prevent "circuit components from catastrophic failure". There is no suggestion or implication that the inductor otherwise poses any threat for catastrophic failure of any load, much less a threat that is alleviated by providing a housing. The purpose for the housing in Smith is to isolate the live AC voltage/current from inadvertent contact.

Moreover, Chermin and Smith are directed to vastly different devices having vastly different needs. Chermin is directed to a starter circuit for a gas vapor lamp that automatically turns off when lamp burns out. Smith is directed to an AC power strip.

Thus, to the extent Smith teaches the need for a protective housing, it teaches that protective housings may be necessary when providing a standard AC outlet plug. As a

consequence, one of ordinary skill in the art would not be motivated to employ the protective housing of Smith in the gas vapor lamp starter circuit of Chermin.

Furthermore, neither Smith nor Chermin teach or suggest that there is tendency of *inductive coils*, such as the inductive coil 8 of Chermin, to explode. Indeed, there is no teaching or suggestion that there is a danger that *any* elements in the Chermin circuit have a tendency to explode. Thus, the prior art simply provides no motivation or suggestion to provide a protective housing over an inductor, much less an inductor in a gas vapor lamp starter circuit.

As a result, it is respectfully submitted that the Examiner has not set forth a prima facie case of obviousness of claim 1. It is therefore requested that the obviousness rejection be reversed for at least this reason.

2. Chermin and Smith are Non-Analogous Art

Two criteria exist for determining whether prior art is analogous. First, it must be determined whether the art is from the same field of endeavor. Second, if the art is not from the same field of endeavor, it must be determined whether the reference is still reasonably pertinent to the problem with which the inventor was involved. *E.g. In re Clay*, 23 U.S.P.Q.2d 1058, 1060-61 (Fed. Cir. 1992). Chermin and Smith do not meet either criteria.

A. Chermin and Smith are Not in the Same Field of Endeavor

Smith is not from the same field of endeavor as Chermin. As discussed above, Chermin is directed to a starter circuit for igniting a low-pressure sodium lamp. Such

starter circuits are obviously very specialized in nature, and have a unique set of problems.

By contrast, Smith is directed to power strip having AC outlets. Moreover, the power strip is especially configured "for use in high definition audio and video systems employing a device having a digital switching source". (Smith at Abstract). Special purpose AC power strips and sodium lamp igniters are plainly not the same field of endeavor.

B. Smith is Not Reasonably Pertinent to the Problems of Chermin

Chermin is directed to a problem relating to the unnecessary delivery of voltage to a failing sodium lamp in a sodium lamp igniter. (Chermin at col. 1, line 32 to col. 2, line 13). The problem arose from sodium lamp starter circuits that continued to provide power to the ballast of the lamp even when the lamp failed, thereby wasting power. (*Id.*).

By contrast, Smith is directed to the problem of sound degradation on high definition audio or video devices due to high frequency noise components on the AC power line. Smith creates a power strip that includes filtering circuitry to eliminate such noise components. (Smith at col. 1, lines 9-45).

The problem of high frequency noise degradation of audio or video components is not reasonably pertinent to the problem of energy inefficiency in sodium lamp starter circuits. The problems are distinct, and their solutions are distinct. For the foregoing reasons, Smith is not reasonably pertinent to the problems faced by the inventor of Chermin.

C. Conclusion as to Non-Analogous Art

Because Chermin and Smith are not from the same field of endeavor, and because the teachings of Smith are not reasonably pertinent to the problem with which the inventor of Chermin was involved, Chermin and Smith are non-analogous art. As a consequence, the Examiner's combination of Chermin and Smith is improper.

Second Claim Grouping: Claim 3 is Not Obvious Over Chermin, Smith and Myong

Discussion re: Patentability of Claim 3

1. Claim 3

As an initial matter, claim 3 depends from claim 1 and is patentable for at least the same reasons. The addition of Myong does not make the combination of Chermin and Smith proposed by the Examiner legitimate.

2. Claim 3 is Patentable for Additional Reasons

Claim 3 has the following limitation:

> a polymeric positive temperature coefficient device (PPTC) connected in series with the inductor between the voltage source and the load, wherein the protective barrier is configured to physically isolate both the inductor and the PPTC from the load.

Accordingly, claim 3 incorporates a PPTC that is also isolated from the load by the protective barrier.

3. No Motivation or Suggestion to Combine Smith, Myong and Chermin

In the October 19, 2004 Office Action the Examiner rejected claim 3 as being obvious over Chermin in view of Smith, in further view of Myong. In particular, the

Examiner stated, among other things, that it would have been obvious to replace the PTC resistor of Chermin with the PPTC device taught by Myong.

As will be discussed below in detail, the Examiner has not set forth a legally sufficient motivation or suggestion to modify Chermin with *either* of Myong or Smith.

A. No Motivation or Suggestion to Replace the PTC Resistor of Chermin with the PPTC Device of Myong

In the March 26, 2004 Office Action, the Examiner concedes that the combination of Chermin and Smith does not teach a PPTC. (October 19, 2004 Office Action at p.3) Instead, the Examiner alleges that it would have been obvious to combine the PPTC of Myong with the arrangement of Chermin. In particular, the Examiner set forth the following reasoning for the proposed combination:

> The combination of Chermin and Smith disclose a PTC resistor instead of a PPTC device as claimed. Myong discloses a protection circuit uses a PPTC resistor to protect excess current or temperature (col. 1, lines 29-42). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have replaced the PTC resistor of Chermin to use the PPTC device of Myong because Myong teaches that PPTC devices have lower resistivities than PTC resistor (col. 1, lines 37-42).

(*Id.* at pp.5-6).

Applicants respectfully submit that there is no motivation or suggestion to combine Chermin and Smith with Myong as proposed by the Examiner. As an initial matter, Chermin employs a PTC to *reduce power consumption* in a sodium gas lamp igniter when the lamp will not ignite. (See e.g. Chermin at col. 1, lines 21-32). Chermin does not appear to require anything to "protect [from] excess current or temperature", as suggested by the Examiner. Moreover, Myong does not appear to suggest that a PPTC is more capable of protecting components from excess current or temperature than other PTCs.

At best, Myong suggests that PPTCs having a conductive polymer "have lower resistivities" than other PTCs formed from doped ceramics. (Myong at col. 1, lines 29-41). However, Myong does not appear to teach that lower resistivity translates into better protection against excess current or temperature. Indeed, if the PTC is used in series, then it would appear that *higher* resistivity, not *lower*, would provide better protection against excess current, since current is inversely proportional to resistance.

Indeed, the only teaching of Myong regarding protection is that PTC devices *in general* (both ceramic and conductive) protect electrical components from excess temperatures and currents, which is well known in the art. (*Id.* at col. 1, lines 37-41). Even if a lower resistivity PTC were assumed to provide better protection, Chermin is not directed to a device having the primary purpose of protection against overcurrent or temperature. The PTC of Chermin instead is intended to reduce current when the operation of the igniter is not necessary. To this end, the PTC of Chermin provides a load-shedding function.

Thus, Myong contains no teaching that a PPTC is particularly advantageous in a device similar to that of Chermin. Instead, Myong is directed to traditional fault handling operations and protection against overcurrent. Even if a lower resistivity were useful in protecting against overcurrent (which would seem paradoxical), Myong neither suggests nor implies that lower resistivity is useful in Chermins application of PTCs. Finally, it is not clear whether the replacement of the resistive PTC of Chermin with a PPTC would actually be harmful to the circuit of Chermin. In any event, Myong does not suggest that a PPTC is advantageous over a PTC resistor in the circuit of Chermin.

Thus, for reasons independent of those discussed above in connection with claim 1, it is respectfully submitted that the rejection of claim 3 as being obvious over Chermin and Smith in view of Myong is in error and should be reversed.

Third Claim Grouping: Claim 2 is Not Obvious Over Chermin, Myong and Miyasaka

Discussion re: Patentability of Claim 2

1. Claim 2

Claim 2 has the following limitation:

> polymeric positive temperature coefficient device (PPTC) coupled between the voltage input and the load; and
> a protective barrier interposed between the PPTC and the load, the protective barrier configured to physically isolate the PPTC from the load

Accordingly, claim 2 includes a protective barrier similar to claim 1, except that the protective barrier surrounds a PPTC as opposed to an inductor.

2. No Motivation or Suggestion to Combine Miyasaka, Myong and Chermin

In the October 19, 2004 Office Action the Examiner rejected claim 2 as being obvious over Chermin in view of Myong, in further view of Miyasaka. In particular, the Examiner first stated that it would have been obvious to replace the PTC resistor of Chermin with the PPTC device taught by Myong. The Examiner then noted that it would have been obvious to modify the protection circuit of Chermin to incorporate a housing as taught by Miyasaka to provide the claimed physical isolation.

As will be discussed below in detail, the Examiner has not set forth a legally sufficient motivation or suggestion to modify Chermin with *either* of Myong or Miyasaka.

A. No Motivation or Suggestion to Replace the PTC Resistor of Chermin with the PPTC Device of Myong

As discussed above in connection with claim 3, there is no legally sufficient motivation or suggestion to replace the PTC resistor of Chermin with the PPTC device of Myong. For at least this reason, it is respectfully submitted that the rejection of claim 2 as being obvious over Chermin in view of Myong and Miyasaka is in error and should be reversed.

B. No Motivation to Modify Device with Housing of Miyasaka

The Examiner admitted that the combination of Chermin and Myong did not teach the claimed protective barrier. (October 19, 2004 office action at p.6). The Examiner instead alleged that it would have been obvious to incorporate the housing of Miyasaka to form the claimed protective barrier. (*Id.*) The Examiner alleged that the motivation for such a combination would be "in order to provide isolation to PTC device from catastrophic failure due to surge voltage condition". (*Id.*)

Even if the circuit of Chermin were modified to include a PPTC, there is no motivation or suggestion to combine such a modified version of Chermin with the housing of Miyasaka. As will be discussed below, Miyasaka does *not* teach the use of a housing to provide isolation to the PTC device from catastrophic failure due to a surge voltage condition, as alleged by the Examiner.

More specifically, Miyasaka teaches a housing containing a PTC element. The housing includes retaining elements having slidable contact between the elements and the top of the housing. This modifies the elastic deformation of the element, and allows for insertion and removal of the PTC element. (Miyasaka at Abstract). Thus, the purpose of the housing arrangement of Miyasaka is to provide a more structurally sound configuration for installation and removal. (*Id.* at col. 1, lines 25-45). Miyasaka does *not* teach that the housing is for the purpose of protecting against catastrophic failure due to a surge voltage condition. Indeed, there is no indication that the housing taught by Miyasaka is suitable to provide such protection.

As a consequence, one of ordinary skill in the art would not be motivated by the need for surge voltage protection to modify the PTC of Chermin by enclosing it in the housing of Miyasaka. Accordingly, the Examiner has failed to set forth a prima facie case of obviousness with respect to claim 2.

Fourth Claim Grouping: Claims 5 and 35 are Not Obvious Over Chermin, Myong and Miyasaka

Discussion re: Patentability of Claim 5

1. Claim 5

Claim 5 has the following limitation:

> protective barrier configured to physically isolate the inductor, the resistor and the PPTC from the load

Accordingly, claim 5 includes a protective barrier similar to claim 1, and further includes a PPTC device similar to claim 2, discussed above. The protective barrier isolates the PPTC device *and* the inductor from the load.

2. No Motivation or Suggestion to Combine Miyasaka, Myong and Chermin

In the October 19, 2004 Office Action the Examiner rejected claim 2 as being obvious over Chermin in view of Myong, in further view of Miyasaka. In particular, the Examiner first stated that it would have been obvious to replace the PTC resistor of Chermin with the PPTC device taught by Myong. The Examiner then noted that it would have been obvious to modify the protection circuit of Chermin to incorporate the housing of Miyasaka to provide the claimed physical isolation.

As will be discussed below in detail, the Examiner has not set forth a legally sufficient motivation or suggestion to modify Chermin with *either* of Myong or Miyasaka. Alternatively, or in addition, the proposed combination does not arrive at the invention of claim 5 because there is no teaching to isolate the inductor from the load.

A. Arguments of Claim 2 Apply to Claim 5

As discussed above in connection with claim 2, there is no motivation or suggestion to modify Chermin to include a PPTC instead of a PTC resistor. As further discussed above in connection with claim 2, there is no motivation or suggestion to incorporate the housing to Miyasaka to isolate the PPTC, if it were indeed included in Chermin.

B. No Teachings in Prior Art to Isolate the Inductor from the Load

Moreover, claim 5 further recites that the inductor is physically isolated from the load. None of Chermin, Myong or Miyasaka, either alone or in combination, teach or

suggest isolating an inductor from the load *for any reason*, much less to prevent catastrophic damage due to a surge voltage condition. Miyasaka merely teaches a special enclosure for a PTC for reasons relating to ease of installation and removal. Miyasaka does not suggest in any way that such a housing is useful for an inductor.

Accordingly, even if Chermin, Myong or Miyasaka were combined as proposed by the Examiner, the resulting device would not include a physical barrier that isolates the inductor of Chermin from the load. As a consequence, for reasons independent of those discussed above in connection with claim 2, the rejection of claim 5 over Chermin, Myong and Miyasaka is improper and should be reversed.

Discussion re: Patentability of Claim 35

Claim 35 also stands rejected as allegedly being obvious over Chermin in view of Myong in further view of Miyasaka. Claim 35 recites "a protective barrier configured to physically isolate both the inductor and the PPTC from the load". As discussed above, there is no legally sufficient motivation or suggestion to modify Chermin to include a PPTC, nor is there a legally sufficient motivation or suggestion to incorporate the protective housing of Miyasaka into the circuit of Chermin. Moreover, even if such a combination were made, the housing of Miyasaka would only isolate the PPTC, not the inductor, from the load. Accordingly, for at least the same reasons as those set forth above in connection with claim 5, it is respectfully submitted that the obviousness rejection of claim 35 should be reversed.

Fifth Claim Grouping: Claims 4, 25-29, 34, 37 and 38 are Not Obvious Over Chermin and Myong

Discussion re: Patentability of Claim 4

1. Claim 4

Claim 4 has the following limitation:

> an inductor, a separate resistor, and a polymeric positive coefficient temperature device (PPTC) coupled in series between the voltage input and the load

Claim 4 differs from the First and Second Claim Groupings in that it does not recite a protective barrier.

2. No Motivation to Combine References

As discussed above in connection with claim 2, the Examiner concedes that Chermin does not teach the use of a PPTC. (March 26, 2004 Office Action at p.5). Instead, the Examiner alleges that it would have been obvious to combine the PPTC of Myong with the arrangement of Chermin. As also discussed above, there is no motivation or suggestion to combine Chermin and Myong in this manner.

In particular, Chermin employs a PTC to reduce power consumption in a sodium gas lamp igniter when the lamp will not ignite. (See e.g. Chermin at col. 1, lines 21-32). Chermin does not appear to require anything to "protect [from] excess current or temperature", as suggested by the Examiner. Chermin does not allege that there is a danger of excess currents or temperature. The PTC device is used as part of normal operation, and changes state effectively *when a light bulb burns out.* Thus, whatever motivation is provided by Myong to use a PPTC is not applicable to Chermin.

Accordingly, for reasons discussed above in connection with claim 2, the Examiner has not set forth a legally sufficient motivation or suggestion to modify Chermin to include a PPTC such as is taught by Myong.

Discussion re: Patentability of Claims 25, 26, 28 and 29

Claims 25, 26, 28 and 29 also stand rejected as allegedly being obvious over Chermin in view of Myong. Claims 25, 26, 28 and 29 all depend from and incorporate all of the limitations of claim 4. Accordingly, for at least the same reasons as those set forth above in connection with claim 4, it is respectfully submitted that the obviousness rejection of claims 25, 26, 28 and 29 should be reversed.

Discussion re: Patentability of Claim 34

Claim 34 also stands rejected as allegedly being obvious over Chermin in view of Myong. Claim 34 recites the following limitation: "an inductor and a polymeric positive coefficient temperature device (PPTC) coupled in series between the voltage input and the load, the inductor interposed between the PPTC and the voltage input". Thus, claim 34, similar to claim 4 recites a PPTC and an inductor couple between the voltage input and the load. As discussed above, there is no legally sufficient motivation or suggestion to modify Chermin to include a PPTC. Accordingly, for at least the same reasons as those set forth above in connection with claim 4, it is respectfully submitted that the obviousness rejection of claim 34 should be reversed.

Discussion re: Patentability of Claim 37

Claim 37 stands rejected as allegedly being obvious over Chermin in view of Myong. Claim 37 depends from and incorporate all of the limitations of claim 34. Accordingly, for at least the same reasons as those set forth above in connection with claim 34, it is respectfully submitted that the obviousness rejection of claim 37 should be reversed.

Discussion re: Patentability of Claims 27 and 38

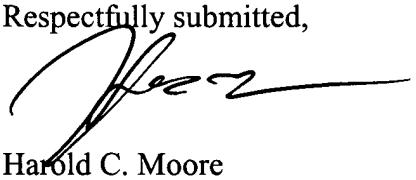
Claims 27 and 38 stands rejected as allegedly being obvious over Chermin in view of Myong in further view of Carpenter. Claim 38 depends from and incorporates all of the limitations of claim 34, and claim 27 depends from and incorporates all of the limitations of claim 4. The Examiner recites Carpenter as teaching the use of an axial lead resistor. (March 26, 2004 office action at p.5). Accordingly, Carpenter is not cited for the purpose of curing the deficiencies of Chermin and Myong with respect to the modification of Chermin to include a PPTC.

As a consequence, for substantially the same reasons as those set forth above in connection with claims 4 and 34, it is respectfully submitted that the obviousness rejections of claim 27 and 38 should be reversed.

(9) CONCLUSION

For all of the foregoing reasons, claims 1-5, 25-29, 34, 35, 37 and 38 are not unpatentable under 35 U.S.C. § 103(a). As a consequence, the Board of Appeals is respectfully requested to reverse the rejection of these claims.

Respectfully submitted,



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CLAIM APPENDIX

1. (amended) A surge protection apparatus connected between an AC electrical utility power line and a load, comprising:

a voltage input coupled to the AC electrical utility power line, the AC electrical utility power line having a nominal AC voltage of at least about 120 volts;

an inductor coupled between the voltage input and the load; and

a protective barrier interposed between the inductor and the load, the protective barrier configured to physically isolate the inductor from the load.

2. (amended) A surge protection apparatus connected between an AC electrical utility power line and a load, comprising:

a voltage input coupled to the AC electrical utility power line, the AC electrical utility power line having a nominal AC voltage of at least about 120 volts;

an polymeric positive temperature coefficient device (PPTC) coupled between the voltage input and the load; and

a protective barrier interposed between the PPTC and the load, the protective barrier configured to physically isolate the PPTC from the load.

3. An apparatus as claimed in claim 1, further comprising a polymeric positive temperature coefficient device (PPTC) connected in series with the inductor between the voltage source and the load, wherein the protective barrier is configured to physically isolate both the inductor and the PPTC from the load.

4. (amended) A surge protection apparatus connected between an electrical power line and a load, comprising:

a voltage input coupled to the electrical power line;

an inductor, a separate resistor, and a polymeric positive coefficient temperature device (PPTC) coupled in series between the voltage input and the load.

5. The surge protection apparatus of claim 4, further comprising a protective barrier interposed between the load and the inductor, the resistor and the PPTC, the protective barrier configured to physically isolate the inductor, the resistor and the PPTC from the load.

24. The surge protection apparatus of claim 5 wherein the protective barrier includes a protective sleeve.

25. The surge protection apparatus of claim 4 wherein the separate resistor has a resistance of at least 10 ohms.

26. The surge protection apparatus of claim 25 wherein the separate resistor has a resistance of approximately 50 ohms.

27. The surge protection apparatus of claim 4 wherein the separate resistor includes axial leads.

28. The surge protection apparatus of claim 4 wherein the inductor is interposed between the voltage input and PPTC.

29. The surge protection apparatus of claim 4 wherein the voltage input is coupled to an AC electrical utility power line.

30. The surge protection apparatus of claim 1 wherein the protective barrier includes a protective sleeve that receives the inductor.

31. The surge protection apparatus of claim 2 wherein the protective barrier includes a protective sleeve that receives the PPTC.

32. A surge protection apparatus connected between an electrical power line source and a load, comprising:

a voltage input coupled to the electrical power line;

an inductor coupled between the voltage input and the load; and

a protective barrier interposed between the inductor and the load, the protective barrier configured to physically isolate the inductor from the load, the protective barrier including a protective sleeve that receives the inductor.

33. The surge protection apparatus of claim 32 further comprising a PPTC coupled in series with the inductor between the voltage input and the load, the PPTC received by the protective sleeve.

34. A surge protection apparatus connected between an electrical power line source and a load, comprising:

a voltage input coupled to the electrical power line; and

an inductor and a polymeric positive coefficient temperature device (PPTC) coupled in series between the voltage input and the load, the inductor interposed between the PPTC and the voltage input.

35. The surge protection apparatus of claim 34 further comprising:

a protective barrier configured to physically isolate both the inductor and the PPTC from the load.

36. The surge protection apparatus of claim 35 wherein the protective barrier includes a protective sleeve that receives the inductor and the PPTC.

37. A surge protection apparatus connected between an electrical power line and a load, comprising:

a voltage input coupled to the electrical power line;

an inductor, a resistor having a resistance of at least about 10 ohms, and a polymeric positive coefficient temperature device (PPTC) coupled in series between the voltage input and the load.

38. The surge protection apparatus of claim 37 wherein the resistor includes axial leads.